No. 4. — *Reports on the Dredging Operations off the West Coast of Central America to the Galapagos, to the West Coast of Mexico, and in the Gulf of California, in Charge of Alexander Agassiz, carried on by the U. S. Fish Commission Steamer "Albatross," during* 1891, Lieut. Commander Z. L. Tanner, U. S. N., Commanding.

[Published by Permission of Marshall McDonald, U. S. Fish Commissioner.]

IX.

Report on the Turbellaria. By W. McM. Woodworth.

The collection, although an extremely small one, is important from the fact that it contains two species that are probably new, and shows for one species, *Planocera pellucida*, a wider distribution than has heretofore been known for it. Furthermore, it adds one to the number of species of Polyclads that are known to be pelagic. Owing to the small number of specimens, I was unable to make sections of any of the material, and my descriptions are based upon an examination of the specimens cleared in glycerin. In such a comparatively superficial study an accurate knowledge of the condition of the sexual organs, which is of great systematic importance, could not be had. All of the forms belong to the class Polycladida, and represent three genera.

Planocera pellucida Mertens.

Two specimens marked, "Surface, 8 P. M., 13° 33′ 30″ N., 97° 57′ 30″ W." Only one specimen of the two was sexually mature, measuring 7 mm. in length by 4.5 mm. broad. The other specimen exhibited no signs of the sexual glands, only the penis and bursa being visible. A comparison of the material with a description of this species recently given by Von Graff [1] leaves no doubt as to their identity. The dimensions of the specimens measured by him are much greater than those given here, his largest one being 18 mm. in length by 13 mm. across at the widest point, and another one measuring 14 mm. in

[1] L. von Graff, "Pelagische Polycladen," Zeitschr. f. wiss. Zool., Bd. LV. Heft 2, pp. 189–219, Taf. VII.–X., 1892. Also in Arbeiten a. d. zool. Inst. z. Graz, Bd. V. No. 1, 1892.

length. My specimens agree so throroughly with the description given by Von Graff that I have no hesitancy in classing them as *Planocera pellucida*. So great a variability in size within a given species is not uncommon among the Turbellaria, and it is to be added that but few specimens of this species have been captured as yet.

Planocera pellucida up to the present time has been recorded (Von Graff, *loc. cit.*) from the Indian Ocean and from the North and South Atlantic, and with *Planocera grubei* and *Stylochoplana sargassicola* was considered by Von Graff as one of the three known cosmopolitan Polyclads. The occurrence, then, of *Planocera pellucida* in the North Pacific gives to this species the widest distribution of any pelagic Planarian.

Stylochoplana californica, sp. nov.

Figures 1, 2.

One specimen, immature, marked, "Station 3435, surface" (26° 48′ 0″ N., 110° 45′ 20″ W., Gulf of California). Length 5 mm., breadth at widest point 2 mm., breadth opposite mouth 1.60 mm. Anterior end rounded, abruptly expanded in the way characteristic of the genus, gradually tapering from the constriction behind the expanded head portion to the blunt posterior extremity. The indentation at the hind end shown in the figure is possibly the result of some injury, although the margin in this region showed no evidence of it. Color of the alcoholic specimen yellowish, very translucent. Margins of the body smooth and even, showing no signs of folds or wrinkles. The most striking character about the specimen is the conspicuousness of the nervous system, which shows with remarkable distinctness, even in the uncleared alcoholic condition, when viewed by transmitted light, it being possible to follow the two posterior longitudinal nerve stems from the brain to the posterior end of the body, where they unite with each other. Some of the transverse commissures, as well as the finer ramifications of the cerebral branches, can also be distinctly traced for considerable distances. The posterior longitudinal stems retain about the same diameter throughout their entire extent, uniting without diminishing in calibre. One stem becomes directly continuous with the other, the two thus forming a loop at the posterior end of the body. The nervous system may be said to consist of a closed ring, which gives off branches from its periphery, and is united by transverse commissures and bears a bilobed enlargement at the anterior end constituting the brain. To my knowledge such a condition of the nervous system exists only among Triclads (*Planaria limuli*[1]). The eyes are arranged with striking symmetry both as regards the tentacles and the roots of the cerebral nerves. The tentacular eye-spots are larger than the cerebral ones, and there are five of them to each tentacle. The symmetry would be perfect but for an additional pair of small cerebral

[1] L. von Graff, Kurze Mittheilungen über fortgesetzte Turbellarienstudien. II. Ueber Planaria limuli. Zool. Anzeiger, Jahrg. II., No. 26, pp. 202–205, 1879.

eyes on the left side anteriorly. There is no membranous capsule about the brain such as is plainly seen in other forms. Mouth two thirds of the total length from the anterior end. The pharynx, anterior to the mouth, is thrown into deep lateral folds. Posterior to the mouth it consists of one long fold, which extends backwards and occupies about one third of the pharyngeal region. Sexual openings separate. The female (posterior) opening lies at a distance of about one fifth the total length from the posterior end, the male (anterior) opening being situated one fifth the distance from this to the mouth. Owing to the specimen being immature, no traces of ova, testes, uterus, or shell-gland can be detected. The penis can be dimly seen, and lying behind it and opening into the female gonopore is what I take to be a bursa copulatrix.

Eight species of Polyclads are classed by Lang (Die Polycladen, p. 629) as being strictly pelagic. Von Graff (*loc. cit.*), who had at his disposal a greater amount of material than had before been accumulated, and who was able to make sections of the different forms, reduces these to five species. Two new species are added to these by him, thus making in all seven species of pelagic Polyclads. Adding to these our species, *Stylochoplana californica*, the number of pelagic Polyclads is increased to eight species. Three of these are cosmopolitan, one has so far been found only in the North Pacific, and seven occur in the Atlantic only.

Prostheceræus panamensis, sp. nov. ?

Figures 3, 4.

One specimen, very much mangled and torn, marked, "No. 201, Panama" (a littoral form from the reef off Panama). The material was in such bad condition that it was impossible to construct a figure of the entire animal. I could not reconcile the specimen to any description of known species, but hesitate in calling it a new species from the scant evidence at my disposal. The specimen when intact must have measured between 30 and 40 mm. in length by about 20 mm. in breadth. The general color of the alcoholic material is a reddish brown, the color being most concentrated along the dorsal median line, becoming fainter toward the margins. The color is due to a pigment distributed in an irregular meshwork, the colorless interspaces of which vary in size and shape. While the pigment is densest in the median line, the colorless interspaces being smaller here, at the edges it is reduced to a delicate network, thus imparting a lighter color to the margins of the body. The tentacles are also pigmented, and are rounded at their ends. Each tentacle has a group of eye-spots scattered along its inner margin. The cerebral eye-spots occupy a space free from pigment near the anterior end of the body. They are crowded together into a common mass, which has a bilobed shape as if the eye-mass had arisen by the fusion of two lateral groups. No traces of any other organs, or of the mouth or sexual openings, could be identified.

Cambridge, June 6, 1893.

EXPLANATION OF THE PLATE.

Fig. 1. *Stylochoplana californica*, from specimen cleared in glycerin to show the habit. × 22. *bu.*, bursa; *in.*, lateral branches of the intestine; *o.*, mouth; *pe.*, penis; *phy.*, pharynx; *t.*, tentacles; ♂, male gonopore; ♀, female gonopore.

Fig. 2. Enlarged drawing of the brain to show the arrangement of the eye-spots and their relation to the tentacles and cerebral nerves.

Fig. 3. *Prosthecerœus panamensis.* Anterior end showing the cerebral eye-mass and tentacular eye-spots. × 27. Owing to the condition of the specimen the anterior margin of the body appears turned under, looking as if the tentacles sprang from the ventral surface of the animal.

Fig. 4. Rhabditi and Pseudorhabditi of the same species, from a bit of teased hypodermis. × 760.